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laterally confined to the central portion of the debris placement boundary, and is not migrating. The detection of several VOCs in the perimeter soil vapor wells was inconsistent with the non-detect VOC results in all 76 of the shallow and subsurface soil gas samples collected from within the debris placement boundary, indicating that the debris placed at AA 3 is not impacting the perimeter soil gas, i.e., there are no VOCs associated with the site.

- this is not full*
- The surface soil (0 – 1 feet bgs) has been adequately characterized and the results show few exceedances of residential EPA Region IX PRGs. The purpose of the surface soil sampling was to quantify the risk due to chemical constituents in surface soil (existing soil cover) to human and ecological receptors at the site. No VOCs were detected in any of the surface soil samples (37 samples at 33 locations). Only 5 SVOCs (benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, B[a]P and dibenz(a,h) anthracene) at only one location out of 33 surface soil sampling locations exceed residential PRGs. 2,3,7,8-TCDD exceeded its residential PRG at only one out of nine surface soil sampling locations analyzed for dioxin and furan. All metals that were analyzed were less than either background or PRG concentrations at all 33 surface soil sampling locations. Petroleum hydrocarbons were detected at very low concentrations ranging from 0.02J to 160 mg/kg. These results, coupled with site-specific risk assessments, indicate that the surface soil does not pose a significant risk to ecological and human health.
 - The purpose of subsurface soil sampling was to help adequately characterize the nature of the debris and evaluate the risk of adverse human health and ecological effects at this site. Evaluation of analytical results based on subsurface soil samples collected during previous investigations indicates that the subsurface soil does not pose a significant risk to human health. In addition, this evaluation of subsurface analytical results shows that construction debris does not contain any significant levels of contamination. None of the detected VOCs exceeds residential PRGs. Only one SVOC (benzo[a]pyrene) in only one sample (20242-1111) out of 24 samples exceeded its residential PRG. Asbestos and perchlorate were not detected in any of the subsurface soil samples. Of 24 samples analyzed, 19 samples had detected concentrations of diesel range petroleum hydrocarbons; however, of these 19 detections, 17 samples had concentrations ranging between 12 mg/kg to 370 mg/kg. The remaining two samples had concentrations of 1,100 mg/kg and 5,600 mg/kg. Only 2 of 24 samples analyzed for arsenic and only 1 of 24 samples analyzed for antimony, cadmium, lead, and molybdenum exceeded both background concentrations and PRGs. Metal analytical results indicate high variability in concentrations of metals at the site, which is not uncommon and can be attributed to natural conditions.
 - *no* The groundwater analytical results indicate that even though construction debris is in close proximity to, and in some places, within the groundwater, the debris placed at the site is not affecting the groundwater quality at the site. The detected VOCs from four sampling events during 1999 to 2003 are MTBE (2 detections in 1999 at one well [including a duplicate] less than the MCL) and chloroform (1 detection less than the MCL). Detected SVOCs are m/p-cresol (1 detection less than the tap water PRG), diethylphthalate (2 detections less than the tap water PRG), and phenol (1 detection less than the tap water PRG). A single detection of motor oils and diesel fuel petroleum hydrocarbons was recorded in the December 2002 groundwater sample from well MW02, as well as one trace detection of diesel in MW08. From all sampling events, the only metals that were detected above their regulatory threshold (MCLs) were, chromium (2 detection above its MCL in 2000 and 2002), nickel (1 detection above its MCL in 2002) and selenium (1 detection above its MCL in 1999). The analytical results from all the groundwater samples collected from the periphery of the debris placement boundary indicate low concentrations and low frequency of detection. The spatial distribution of groundwater COPCs indicates that there is no impact to the groundwater due to historical activities or debris at the site.

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In conclusion, this evaluation of ecological risk suggests that anthropogenic activities have not had a negative effect on ecological receptors.

ES.6 CONCLUSIONS AND RECOMMENDATIONS

- No Further Action is recommended for all APHO anomalies (contiguous and non-contiguous) associated with AA 3 i.e., APHO 59, APHO 60, APHO 61, APHO 62, APHO 63, APHO 64, and APHO 65.
- Debris placement delineation is complete and it is consistent with previous estimates developed using the topographic drawings.
- Debris characterization indicates that predominantly inert construction debris is placed within the limits of AA 3 site.
- Analysis conducted on various media (air, soil gas, soil, groundwater, sediment, and surface water) to assess any impact due to the debris placement, did not reveal significant contamination.
- Based on results from two trenching activities (previous and RSE investigations) and subsurface exploration during soil gas survey, it was confirmed that there is approximately 2 to 5 feet of soil cover over the construction debris encountered.
- Based on the data collected during trenching activities (March 2000 and October 2002) as well as borehole data, along with the evaluation of historical topographic maps, the lateral and vertical limits of construction debris placement, and the existing soil cover depth, were estimated. RSE trenching has confirmed that the initial demarcation of debris placement was fairly accurate with the exception of one area near the southeast corner of the site where the boundary was revised inward. The revised area of AA 3 based on the inward revision is approximately 5.15 acres (225,000 square feet). *adequate soil samples b*
- Air sampling results show that integrated surface air samples are not influenced by construction debris placed at the site and the results are consistent with ambient air samples. Although low concentrations of VOCs (including common laboratory contaminants) were detected in ambient air and integrated surface air samples, no VOCs were detected in **any** of the soil gas samples collected from within the debris placement boundary. Methane was detected in integrated surface air samples at concentrations ranging from 2 to 3 ppmv, similar to ambient air concentrations. There is no significant difference between the upwind and downwind ambient air sample results.
- The shallow, subsurface, and perimeter soil gas sampling results support the initial premise that predominantly inert construction related debris were placed at AA 3. The concentrations, frequency of detection and spatial distribution of VOC and methane detections are below levels that would require management. **None** of the 33 shallow soil gas samples collected from within the debris placement boundary had detected concentrations of 51 VOC analytes and methane. Similarly, **none** of the 43 subsurface soil gas samples (also collected from within the debris placement boundary) had any detections of 51 VOC analytes. The field screening results for the subsurface soil gas samples showed non-detect methane concentrations at 25 of 33 sampling locations, with detected concentrations (at 8 locations) ranging from 6,000 ppmv to 230,000 ppmv. The eight locations with detectable methane concentrations were confined to the central portion of the site, with only three central sampling locations (out of 33 total locations) exceeding the Title 27 CCR stipulated LEL of 50,000 ppmv for methane. No methane was detected in any of the perimeter soil gas wells during three rounds of sampling. The results indicate that subsurface methane is vertically confined to the subsurface (deeper than 5 feet) and

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Sediment. Table ES-4 presents the receptors with HQs greater than 1. Three metals in sediment, chromium, mercury, and vanadium, have an HQ value less than one with respect to all receptors.

The HQ values for aluminum, cadmium, nickel, selenium, and zinc in sediment are greater than 1 for at least one receptor. However, the maximum sediment concentrations for these COPECs do not exceed Station background concentrations. Therefore, potential adverse effects due to these metals is not attributable to anthropogenic activities.

Table ES-4: Hazard Quotient Values > 1 for Sediment COPECs after BERA Calculations

COPEC	Ornate Shrew	Deer Mouse	Long-tailed Weasel	Mourning Dove	Spotted Towhee	Red-shouldered Hawk
Metals						
Aluminum	7E+01	4E+01	6E+00	—	—	—
Cadmium	2E+00	—	—	—	—	—
Nickel	1E+01	8E+00	—	—	2E+00	—
Selenium	2E+00	2E+00	—	—	—	—
Zinc	2E+00	2E+00	—	—	—	—

Notes:

COPEC = chemical of potential ecological concern — = HQs less than 1

Surface water. Surface water risk calculations for the BERA could not be refined because 95% UCL values could not be estimated due to the relatively small data set and because of the lack of more realistic exposure assumptions. Copper was also carried through to BERA because its maximum reporting limit range exceeded the surface water screening value for the protection of aquatic life. Therefore this HQ could be underestimated. However, this COPEC was not detected in surface water ; therefore, it cannot be further evaluated in the BERA.

ES.5.3 Conclusions of the BERA

In re-evaluating ecological risk based on refined exposure assumptions, the exposure of ecological receptors to selenium in surface soil at AA 3 may present a threat of adverse effects (HQ=2). This adverse effect is likely due to naturally high levels of selenium at the site. For 2,3,7,8-TCDD TEQ (mammal), no observed adverse no observed adverse effect level (NOAEL)-based HQs for the ornate shrew and deer mouse were 7 and 3, respectively, exceeding the risk point of departure of 1. The lowest observed adverse effect level (LOAEL)-based HQ for the ornate shrew (HQ = 0.7) and the deer mouse (HQ = 0.3) are both below 1. This suggests that small mammal populations are not at risk from site dioxins, although certain individuals may be. The bioavailability of dioxins in soil may also be overestimated. Large organic molecules such as dioxins bind tightly with organic matter found in natural soils and may not be generally bioavailable. Risk managers should consider the risk range for the shrew and deer mouse in making decisions regarding further action at the site.

Ecological risk from exposure to sediment at AA 3 does not present a significant threat of adverse effects (based on refined exposure assumptions for sediment).

Although results show potential risk to aquatic life in surface water (Agua Chinon Wash) due to several COPECs in surface water, concentrations of these COPECs in the upgradient and down gradient samples were similar. This indicates that AA 3 has not had an adverse impact on water quality in the Agua Chinon Wash.

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ES.5.2 BERA Process

The BERA (Tier 2, Step 3a) uses the same representative species, exposure pathways, and toxicity reference levels (TRVs), with refined exposure assumptions to better estimate the potential risk to ecological receptors from COPECs that failed the conservative SERA process. The results of the BERA risk calculations and characterization in specific media is presented below.

Soil. Table ES-3 presents the receptors with HQs greater than 1. Beryllium, copper, lead, mercury, vanadium, and 2,3,7,8-TCDD (bird) have HQ values equal to or less than one with respect to all receptors. Other COPECs carried through to BERA because their respective maximum reporting limit ranges exceeded the soil screening value for ecological risk were not detected in surface soil at the site and therefore were not evaluated further in the BERA. However, they could be present at the site and therefore, their potential to cause adverse effects are underestimated.

The HQ values for aluminum, antimony, cadmium, chromium, nickel, selenium, vanadium, zinc, and 2,3,7,8-TCDD (mammal) in soil are greater than 1 for at least one receptor. Six of these COPECs, including, antimony, cadmium, chromium, nickel, vanadium, and zinc, had maximum soil concentrations (0 to 6 ft bgs) that do not exceed Station background concentrations. Therefore, site activities did not result in a release of these COPECs that would cause adverse effects to terrestrial wildlife at AA 3. Aluminum present in soils with a pH of 5.5 or above is not considered bioavailable. Therefore, it can be concluded that aluminum does not pose adverse effects to terrestrial wildlife at AA 3.

Although the maximum concentration and 95% UCL of selenium exceed the Station background concentration, there is uncertainty in risk estimation. The soils in the western part of the U.S., have naturally high levels of selenium compounds. In addition, since other metals at the site do not show signs of anthropogenic influence, the Station background concentrations may underestimate naturally high levels of selenium in soil at AA 3. Finally, the bioavailability of dioxins in soil may also be overestimated. Large organic molecules such as dioxins bind tightly with organic matter found in natural soils and may not be generally bioavailable. However, with HQs as high as 7, dioxins in soil will require further evaluation.

Table ES-3: Hazard Quotient Values > 1 for Soil COPECs after BERA Calculations

COPEC	Ornate Shrew	Deer Mouse	Long-tailed Weasel	Mourning Dove	Western Meadowlark	Red-shouldered Hawk
Metals						
Aluminum	4E+02	2E+02	1E+01	—	3E+00	—
Antimony	7E+00	3E+00	—	2E+00	3E+01	—
Cadmium	2E+00	—	—	—	—	—
Nickel	1E+01	1E+01	—	—	2E+00	—
Selenium	3E+00	2E+00	—	—	—	—
Vanadium	5E+00	2E+00	—	—	—	—
Zinc	4E+00	3E+00	—	—	2E+00	—
Dioxins						
Total 2,3,7,8-TCDD (Mammal) ¹	7E+00	3E+00	—	NA	NA	NA

Notes:

COPEC - chemical of potential ecological concern

NA = Analyte is not a COPEC in this medium

TEQ = Toxicity equivalent quotient

TEQ value calculated based on TEFs for birds and mammals respectively.

= HQs less than 1

TCDD = 2,3,7,8-tetrachlorodibenzo-p-dioxin

TEF = toxicity equivalency factor

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- assumption

Table ES-2: Human Health SSPRE results (based on RME EPCs)

Type	Residential	Visitor	Construction Worker	Agricultural Worker	Recreational User
Surface - Including Background					
Cumulative ECR	1.2×10^{-5} <u>Contributors</u> 69% – arsenic 24% – total 2,3,7,8-TCDD (TEQ)	1.0×10^{-6} <u>Contributors</u> 68% – arsenic 24% – total 2,3,7,8-TCDD (TEQ)	2.4×10^{-7} <u>Contributors</u> 66% – arsenic 23% – total 2,3,7,8-TCDD (TEQ)	6.6×10^{-7} <u>Contributors</u> 68% – arsenic 24% – total 2,3,7,8-TCDD (TEQ)	1.4×10^{-6} <u>Contributors</u> 68% – arsenic 24% – total 2,3,7,8-TCDD (TEQ)
HI	<1	<1	<1	<1	<1
Surface - Excluding Background					
Cumulative ECR	3.8×10^{-6} <u>Contributors</u> 12% – B[a]P 7% – dibenz(a,h)anthracene 78% – total 2,3,7,8-TCDD (TEQ)	3.4×10^{-7} <u>Contributors</u> 15% – B[a]P 9% – dibenz(a,h)anthracene 74% – total 2,3,7,8-TCDD (TEQ)	8.4×10^{-8} <u>Contributors</u> 18% – B[a]P 11% – dibenz(a,h)anthracene 69% – total 2,3,7,8-TCDD (TEQ)	2.1×10^{-7} <u>Contributors</u> 15% – B[a]P 9% – dibenz(a,h)anthracene 74% – total 2,3,7,8-TCDD (TEQ)	4.6×10^{-7} <u>Contributors</u> 15% – B[a]P 9% – dibenz(a,h)anthracene 74% – total 2,3,7,8-TCDD (TEQ)
HI	<1	<1	<1	<1	<1
Subsurface - Including Background					
Cumulative ECR	1.4×10^{-6} <u>Contributors</u> 71% – arsenic 26% – B[a]P	—	3.4×10^{-7} <u>Contributors</u> 58% – arsenic 37% – B[a]P	8.5×10^{-7} <u>Contributors</u> 65% – arsenic 31% – B[a]P	—
HI	<1	—	<1	<1	—
Subsurface - Excluding Background					
Cumulative ECR	4.2×10^{-6} <u>Contributors</u> 9% – benz(a)anthracene 88% – B[a]P	—	1.4×10^{-7} <u>Contributors</u> 9% – benz(a)anthracene 89% – B[a]P	3.0×10^{-7} <u>Contributors</u> 9% – benz(a)anthracene 89% – B[a]P	—
HI	<1	—	<1	<1	—

NOTES:

ECR = excess cancer risk

HI = hazard index

— = not evaluated

RME-EPC = reasonable maximum exposure exposure point concentration

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ES.5 ECOLOGICAL RISK ASSESSMENT

A *Draft Screening Ecological Risk Assessment, Removal Site Evaluation, Anomaly Area 3* (Earth Tech 2003a) was submitted to the BCT on 13 May 2003 for their review and comment. The report presented the representative species selected for the site and the exposure parameters that were used for the ecological assessment, and SERA risk estimates. A working draft of the BERA was also presented in the draft report. The regulatory agency comments on the draft SERA were incorporated and are presented in this Draft ESI document.

Consistent with the recommendations from the BCT members, seven species (3 mammals and 4 birds—ornate shrew, deer mouse, long-tailed weasel, western meadowlark, spotted towhee, mourning dove, red-shouldered hawk) were selected as representative terrestrial species. The earthworm was chosen to represent terrestrial invertebrates. The most conservative species-specific exposure assumptions are used to estimate SERA exposure factors.

ES.5.1 Conclusions of the SERA

Plants and Invertebrates – The maximum soil concentrations of aluminum, chromium, selenium, vanadium, and zinc exceed plant and invertebrate screening concentrations (Oak Ridge National Laboratory [ORNL] soil benchmark). These concentrations result in hazard quotients (HQs) of 1 or greater, which indicate a potential for adverse effects to ecological receptors. In addition, two volatile organic compounds (VOCs), fourteen semivolatile organics (SVOCs) and dioxins detected in surface soil did not have ORNL soil benchmark concentrations.

Terrestrial Receptors – Soil. The maximum soil concentrations of aluminum, antimony, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, vanadium, zinc, and total 2,3,7,8-TCDD (mammal and bird) result in HQ values equal to or greater than 1, which indicate a potential for adverse effects to lower trophic level terrestrial mammal and bird receptors at AA 3. These chemicals of potentials ecological concern (COPECs) were retained for further evaluation in Tier 2.

Sediment. Sediments found in the dry wash were evaluated as soil because they do not support a benthic community. The maximum sediment concentrations for aluminum, cadmium, chromium, mercury, nickel, selenium, vanadium, and zinc result in HQs of 1 or greater, which indicate a potential for adverse effects to terrestrial mammal and bird receptors at Agua Chinon Wash. These COPECs were retained for further evaluation in Tier 2.

Aquatic Life – Surface water in the wash is ephemeral and does not support an aquatic community, but was screened against aquatic screening criteria because it may influence down-stream aquatic communities. The maximum surface water concentrations of aluminum, barium, beryllium, cadmium, chromium, cobalt, lead, manganese, nickel, vanadium, and zinc exceed surface water screening concentrations (National recommended water quality criteria [NRWQC] or Great Lakes Tier II values). These concentrations result in HQs of 1 or greater, which indicate a potential for adverse effects to aquatic organisms at Agua Chinon Wash. The concentrations of these COPECs were approximately equal in the upgradient and down gradient samples. These COPECs were retained for further evaluation in Tier 2.

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The SPRE first entailed a comparison of site exposure point concentration (EPCs) to residential preliminary remediation goals (PRGs) for relevant exposure pathways. This comparison indicated risk above the cancer and non-cancer points-of-departure. Therefore, all EPCs were compared to industrial PRGs to characterize risk to receptors under that land use scenario. *why?*

The results of SPRE and the COPCs that significantly contribute to the site risk are presented in the Table ES-1 below. Lead concentrations in the surface and subsurface soil do not exceed the residential criterion of 400 mg/kg. Therefore, further evaluation of the lead in surface and subsurface soil was not warranted.

Table ES-1: Human Health SPRE results (RME EPC based)

Soil Stratum	Residential Scenario (RME-EPC based)		Industrial Scenario (RME-EPC based)	
	Cumulative ECR	HI	Cumulative ECR	HI
Surface – Including Background	1.3×10^{-5} <u>Major Contributors</u> 65% – arsenic 23% – total 2,3,7,8-TCDD (TEQ)	1.1 <u>Major Contributors</u> 13% – arsenic 12% – aluminum 49% – iron 10% – manganese	3.1×10^{-6} <u>Major Contributors</u> 64% – arsenic 23% – total 2,3,7,8-TCDD (TEQ)	<1.0 <u>Major Contributors</u> 14% – antimony 34% – arsenic 28% – manganese 11% – vanadium
Subsurface – Including Background	1.6×10^{-5} <u>Major Contributors</u> 64% – arsenic 24% – B[a]P	<1.0 <u>Major Contributors</u> 46% – arsenic 31% – manganese 14% – vanadium	4.1×10^{-6} <u>Major Contributors</u> 60% – arsenic 26% – B[a]P	<1.0 <u>Major Contributors</u> 46% – arsenic 33% – manganese 13% – vanadium

NOTES:

ECR = ~~excess~~ cancer risk

HI = hazard index

TCDD = tetrachlorodibenzodioxin

B[a]P = benzo(a)pyrene

TEQ = toxicity equivalency quotient

RME-EPC = reasonable maximum exposure-exposure point concentration

Since the comparison of COPC EPCs to industrial PRGs indicated that some of the individual EPCs had risk above the cancer and noncancer points of departure, the site proceeded to the SSPRE. Those chemicals detected in surface and subsurface soils that are associated with risk and or hazards that exceed 1×10^{-6} and 1.0, respectively, (arsenic, benzo(a)anthracene, benzo(a)pyrene (B[a]P), benzo(k)fluoranthene, dibenz(a,h)anthracene, and total 2,3,7,8- tetrachlorodibenzodioxin [TCDD]) were carried into the SSPRE.

To evaluate the future human receptors at AA 3, potential reuse scenarios for AA 3 were included in the SSPRE (residential, visitor, industrial/construction workers, agricultural workers, and recreational users). The results of the SSPRE and the COPCs that significantly contribute to the site risk are presented in Table ES-2 below. The table also presents the risk estimates with and without background contributions.

In summary, the SSPRE risk estimates are all in the risk management range of 10^{-4} to 10^{-6} and hazard indices are below 1. In addition, a significant portion of the risk is attributable to arsenic, which is below the Station-wide background concentrations. Therefore, based on the risk assessment, the site does not pose any significant threat to human health.

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Corporation (SAIC) during a review of historical aerial photographs taken during the period from 1946 through 1992 (SAIC 1993). Historically, the site was used as a source of borrow material. Records indicate that some of the borrow pits and trenches were backfilled with construction debris and later covered with 5 feet or more of fill soil (IT/OHM 2000). A review of historical aerial photographs and topographic maps suggests that placement of construction debris occurred between 1972 and 1988. Interviews with former Station personnel indicate that construction debris generated during the construction of the investigation-derived waste management area at IRP Site 3 were placed at AA 3.

ES.3 PREVIOUS INVESTIGATIONS

A literature and record search was conducted during early 1999, and the BCT conducted a site visit and visual inspection of the area during August 1999. IT/OHM installed monitoring wells and vadose zone wells, conducted a geophysical investigation of the area, and conducted exploratory trenching, which included a radiological screening survey. A technical information package compiling the results of the data collected (IT/OHM 2000) was submitted to the BCT.

ES.3.1 RSE Investigation

The purpose of the RSE field investigation (October 2002 through December 2002) at AA 3 was to collect data necessary for selecting and recommending a response action for the site. The scope of the RSE investigation included the following:

1. Collecting soil vapor, soil, groundwater, and surface water and sediment samples to evaluate the impact, if any, due to waste placement;
2. Confirming the lateral limits of the waste placement;
3. Evaluating of human health and ecological risks;
4. Collecting soil samples to conduct a geotechnical assessment of the existing soil cover.

Activities that were conducted under the purview of RSE investigation included the following: (1) trenching, (2) installation of perimeter vapor monitoring and groundwater wells, (3) cone penetrometer test (CPT) survey, (4) integrated and ambient air sampling, (5) shallow and subsurface soil vapor sampling, (6) perimeter soil vapor sampling, (7) surface soil sampling, (8) geotechnical soil testing, (9) groundwater sampling, (10) sediment sampling, and (11) surface water sampling.

ES.4 HUMAN HEALTH RISK ASSESSMENT

A human health PRE was conducted for AA 3 to help risk managers evaluate if further action is warranted at the site. The analytical results from all investigations conducted at the site were used to conduct the human health PRE. The PRE conducted for the site consists of Tier 1, the screening risk assessment (SRA) (Tier 1A; the screening PRE [SPRE] and Tier 1B; a site specific PRE [SSPRE]). Analytical results from surface soil (0 to 1 foot below ground surface [bgs]), subsurface soil (1 foot to 10 feet bgs), and groundwater analyses were used to identify the human health contaminants of potential concern (COPCs) for each exposure medium evaluated in the PRE. Even though the groundwater pathway was assessed to be complete, groundwater data were not evaluated in the PRE, since, with the exception of two detections of chromium and one detection of nickel and selenium, the COPCs identified had concentrations less than their maximum contaminant levels (MCL) values. All chemicals detected in surface and subsurface soils were retained as COPCs for the human health SPRE.

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This expanded site inspection (ESI) report presents an assessment of the nature, extent, and the potential impact of contamination to human health and the environment at Anomaly Area 3 (AA 3), former Marine Corps Air Station (MCAS), El Toro, California. This report also presents the data collection procedures and analytical results of the removal site evaluation (RSE) field investigation (Earth Tech 2002a) conducted primarily between October and December 2002. The results of the human health preliminary risk evaluation (PRE) and ecological risk assessment (ERA) that were conducted subsequent to the RSE investigation are also presented in this report.

This report was prepared for United States (U.S.) Department of the Navy (DoN), Southwest Division, Naval Facilities Engineering Command (NFECSW SDIEGO), as authorized by the U.S. Navy, Pacific Division, Naval Facilities Engineering Command (NAVFAC EFD PACIFIC PEARL HARBOR HI) under Contract Task Order (CTO) number 0078 of the Comprehensive Long-Term Environmental Action Navy (CLEAN) II program, contract number N62742-94-D-0048.

A screening ERA (SERA) was performed to estimate the risks posed by the site to the ecological receptors by using the analytical results of all investigations conducted at the site. A *Draft Screening Ecological Risk Assessment, Removal Site Evaluation, Anomaly Area 3* (draft SERA) (Earth Tech 2003a) was prepared to present the SERA methodology, selection of the representative species, exposure parameters and the results of the SERA. This report was submitted to the Base Realignment and Closure (BRAC) Cleanup Team (BCT) on 13 May 2003 for their review, comment and concurrence on the SERA methodology and selection criteria for the site. Also, a working draft of the baseline ecological risk assessment (BERA) was also presented in the draft report.

The regulatory agency comments on the draft SERA were incorporated and presented in this Draft ESI document.

ES.1 REGULATORY STATUS

Consistent with the intent of the Federal Facilities Agreement (FFA), the DoN consulted with the members of the BCT regarding implementation of assessment and response actions at AA 3.

The assessment and development of response action for AA 3 was intended to be administratively handled as part of Installation Restoration Program (IRP) Site 3. It was anticipated that a removal action would be required and this would facilitate and expedite implementation of the action at AA 3 and would allow quicker transfer of the property. However, based on the investigations conducted at the site and the human health and ecological risk assessment results, the DoN has opted to present the results of all investigations and risk assessments at AA 3 in this draft ESI report and recommend a response action for AA 3 site. Subsequent to regulatory review, comments and concurrence on the recommended response action, this report will be finalized and issued.

ES.2 BACKGROUND

Former MCAS El Toro is located in Orange County, California, approximately 8 miles southeast of Santa Ana and 12 miles northeast of Laguna Beach. Former MCAS El Toro covers approximately 4,738 acres. Land use around MCAS El Toro includes agricultural, commercial, light industrial, and residential. MCAS El Toro closed on 2 July 1999, as part of the BRAC Act.

Anomaly Area 3 encompasses an area of approximately 9 acres and is located in the northwestern section of the former MCAS El Toro facility near Pusan Way, adjacent to the Agua Chinon Wash. AA 3 refers to seven aerial photograph (APHO) anomaly areas (APHO 59, APHO 60, APHO 61, APHO 62, APHO 63, APHO 64, and APHO 65) identified by Science Applications International

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- To assess the impact of AA 3 on Agua Chinon Wash, four sediment samples were collected from the upstream and downstream locations on the sediment of Agua Chinon Wash. Out of the complete suite of analysis, only two metals, arsenic (3 samples out of 4) and vanadium (all 4 samples) exceeded the residential PRGs; however, all detected concentrations were lower than background concentrations. Of the organics only motor oil was detected in one of the four samples collected and analyzed in the laboratory (at a low concentration of 20 mg/kg). The highest concentrations of arsenic, vanadium and motor oils were detected from an upstream sediment sample. Surface soil samples did not have arsenic and vanadium concentrations exceeding their respective residential PRG concentrations. Even though the surface soils collected from AA 3 had detected concentrations of motor oils, it is unlikely that AA 3 is the source of this detection, since one upstream sediment sample had the only motor oil detection. Based on these results of the sediment sampling, there is no impact from AA 3 on the sediment of Agua Chinon Wash.
- Two surface water samples were collected from the upstream and downstream locations to assess the possible impact on the surface water within the Agua Chinon Wash. Out of the complete suite of analysis that was conducted on the surface water samples, only two metals, aluminum and chromium were detected at concentrations exceeding their respective MCL concentrations. However, the upstream and downstream concentrations of these constituents were similar, indicating that the AA 3 does not impact the surface water at Agua Chinon Wash.
- The human health risk estimates are all within the EPA-established risk management range of 10^{-4} to 10^{-6} and hazard indices are all below 1. The surface soils (0-1 feet bgs) and subsurface soils (greater than 1 feet to 10 feet bgs) indicate a generally acceptable risk for residential reuse scenarios, with estimated cancer risks of 1.2×10^{-5} and 1.4×10^{-5} , respectively, for each scenario. The risk estimates for other receptor scenarios range from less than 2.4×10^{-7} (construction worker-surface soil scenario) to a maximum of 1.4×10^{-6} (recreational reuse surface soil scenario). In addition, a significant portion of the risk is attributable to arsenic, which is below the Station-wide background concentrations. When arsenic is excluded, the excess cancer risks under each of the residential surface and subsurface soil scenarios decrease to 3.8×10^{-6} , again well within the risk management range of 10^{-6} to 10^{-4} . Excluding the arsenic contribution from the other receptors scenarios decreases the estimated cancer risks to less than the target level of 1×10^{-6} . Therefore, based on the risk assessment, the site does not pose any significant threat to human health.
- Consistent with the NCP Preamble (Federal Register, Volume 55, No.49, Page 8717), several factors were considered by DoN for recommending a response action for the site. The primary factors considered are background levels of COPCs, detection frequency, spatial distribution and mobility. Based on the low concentrations of COPCs, low frequency of detections and spatial distribution, and low mobility characteristics of the few COPCs (e.g., arsenic, SVOCs, and dioxins/furans), AA 3 does not pose unacceptable risk to human health.
- An evaluation performed as part of BERA indicates that all inorganic COPECs with the exception of selenium were below the Stationwide background. The risk posed by this metal is not attributable to anthropogenic sources. In addition, the selenium concentrations in soil at AA 3 may be naturally higher than Stationwide background and may not be attributable to anthropogenic sources. Dioxin exposures are not expected to have an adverse effect on small mammal populations. In re-evaluating ecological risk in the BERA, the exposure of ecological receptors to sediments at AA 3 does not present a threat of adverse effects. Although the ecological risk due to exposure of aquatic life to surface water from the Agua Chinon wash may cause adverse effects, these effects are not attributable to activities at AA 3 since the surface water quality upgradient is similar to the downgradient locations.

Do we have the right kind of data?

EXECUTIVE SUMMARY

- The evaluation of the ecological risk from other media suggests that anthropogenic activities have not had a negative effect on ecological receptors.
- Based on the conclusions cited above and pending the results of the radiological assessment, no further investigation is warranted and site closure is recommended.

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